

IN THE CLAIMS:

Please amend the claims as follows:

27. (Twice Amended) An image display ~~device-system~~ having direct and projection viewing modes of operation, comprising an image display device including:

a transportable housing having first and second light transmission apertures formed therein and aligned with each other;

5 a display panel assembly including

light producing means installed in said transportable housing, for producing light in the direction of a projection axis during said direct viewing mode;

10 a thin lens panel mounted in said transportable housing along said projection axis;

a light guiding panel having first and second light guiding surfaces between which said produced light can be totally internally reflected;

15 a light diffusing structure operably associated with said light guiding panel, for scattering light within said light guiding panel during said direct viewing mode;

a programmable spatial light mask disposed adjacent said thin lens panel, having a display surface and means for spatially modulating the intensity of light transmitted through said thin lens panel during said projection viewing mode;

20 a rear housing panel for covering a substantial portion of said rear light transmission aperture during said direct viewing mode, and having an interior surface;

a light reflective surface disposed on said interior surface of said rear housing panel;

25 a portable light projection device including

a first housing portion containing a light producing device for producing visible light, and a light focusing means for focusing and directing said produced visible light through said display panel assembly for optical processing and conversion into a light image on the display surface of said programmable spatial light mask;

30 a second housing portion having a light image projecting lens for projecting onto a viewing surface, the image displayed on the display surface of said programmable spatial light mask; and

a reconfigurable structure operably connecting said first and second housing portions, said reconfigurable structure being positionable about said ~~display panel~~ transportable housing when said portable light projecting device is used in conjunction with said image display device, and permitting said first and second housing portions to be brought together into a compact arrangement when said portable light projecting device is being stored or transported;

40 wherein during said direct viewing mode, light is produced from said light producing means and is reflected within said light guiding panel and scattered by said

light diffusing structure, and a portion of said scattered light is transmitted through said first light guiding surface and said programmable spatial light mask, whereupon said
45 transmitted light is spatial-intensity modulated so as to form a light image on the display surface of said programmable spatial light mask; and

wherein during said projection viewing mode, light is produced from the light producing device and is transmitted through said thin lens panel and said programmable spatial light mask, whereupon said transmitted light is focused and spatial-intensity
50 modulated so as to form a light image on a viewing surface disposed at a distance from said programmable spatial light mask.

28. (Original) The image display device of claim 27, which further comprises means for displaying on said display surface, a composite pixel pattern representative of a spatially multiplexed image composed of first and second spatially modulated perspective images of a 3-D object, said first spatially modulated perspective
5 image consisting of a first pixel pattern representative of a first perspective image of said 3-D object spatially modulated according to a first spatial modulation pattern, said second spatially modulated perspective image consisting of a second pixel pattern representative of a second perspective image of said 3-D object spatially modulated according to a second spatial modulation pattern, said second spatial modulation pattern being a logical
10 complement of said first spatial modulation pattern, and

a micropolarization panel comprising an optically transparent sheet mounted onto said display surface of said spatial light mask, said optically transparent sheet having first and second optically transparent patterns permanently formed in said first optically

transparent sheet, said first optically transparent pattern spatially corresponding to and
15 being spatially aligned with said first pixel pattern so as to impart a first polarization state
 P_1 to said first pixel pattern, and said second optically transparent pattern spatially
corresponding to and being spatially aligned with said second pixel pattern so as to
impart a second polarization state P_2 to said second pixel pattern, said second polarization
state P_2 being different than said first polarization state P_1 .

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29. (Original) The image display device of claim 28 in combination with
electrically-passive polarization glasses.

30. (Original) The image display device of claim 27, wherein said light guiding
panel has first and second light conducting edges, and wherein said light producing
means comprises first and second fluorescent tubes disposed along said first and second
light conducting edges, respectively, said first and second fluorescent tubes producing
5 and transmitting light through said first and second light conducting edges during said
direct viewing mode.

31. (Original) The image display device of claim 30, which further comprises
first and second light focusing elements disposed in proximity with said first and second
fluorescent tubes, respectively, for focusing light produced from said first and second
fluorescent tubes and directing said focused light across said first and second light
5 conducting edges and into said light guiding panel.

32. (Previously Canceled)

33. (Previously Amended) The image display device of claim 27, which further comprises a light polarizing filter disposed in said first housing portion, for imparting a selected polarization state to visible light transmitted through said display panel assembly.

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34. (Original) The image display device of claim 27, which further comprises an optically transparent touch-screen panel disposed adjacent said programmable spatial light mask.

35. (Twice Amended) A portable computer-based system having direct and projection viewing modes of operation, comprising an image display device including:

(A) a transportable housing of compact construction and having first and second light transmission apertures formed therein and aligned with each other,

5 (B) data storage means, disposed in said transportable housing, for storing data representative of one or more light images to be displayed;

(C) a backlighting construction disposed in said transportable housing, having direct and projection viewing modes of operation, and including

10 (1) light producing means installed in said transportable housing, for producing light in the direction of a projection axis during said direct viewing mode,

(2) a thin lens panel mounted in said transportable housing along said projection axis,

15 (3) a light guiding panel having first and second end portions, and first and second light guiding surfaces between which said produced light can be totally internally reflected,

 (4) a rear housing panel having a spatial extent sufficient for covering a substantial portion of said rear light transmission aperture during said direct viewing mode,

20 (5) a light reflective surface disposed adjacent the interior surface of said rear housing panel, and

 (6) a light diffusing structure operably associated with said light guiding panel, for scattering light within said light guiding panel during said direct viewing mode;

25 (D) a programmable spatial light mask, disposed adjacent said thin lens panel, having a display surface and means for spatially modulating the intensity of light transmitted through said programmable spatial light mask;

 (E) a portable light projection device including

30 a first housing portion containing a light producing means for producing visible light, and a light focusing means for focusing and directing said produced visible light on the display surface of said programmable spatial light mask;

a second housing portion having a light image projecting lens for projecting onto a viewing surface, the image displayed on the display surface of said programmable spatial light mask; and

a reconfigurable structure operably connecting said first and second housing portions, said reconfigurable structure being positionable about said transportable display panel housing when said portable light projecting device is used in conjunction with said image display device, and permitting said first and second housing portions to be brought together into a compact arrangement when said portable light projecting device is being stored or transported;

wherein during said direct viewing mode, light is produced by said light producing means and is reflected within said light guiding panel and scattered by said light diffusing structure, and a portion of said scattered light is transmitted through said first light guiding surface and said programmable spatial light mask, whereupon said transmitted light is spatial-intensity modulated so as to form a light pattern on the display surface of said programmable spatial light mask, and

wherein during said projection viewing mode, light is produced from the light producing means and is reflected off said light reflective surface and transmitted through said thin lens panel and said programmable spatial light mask, whereupon said transmitted light is focused and spatial-intensity modulated so as to form a light image on a viewing surface at a distance from said programmable spatial light mask.

36. (Original) The portable computer-based system of claim 35, wherein said light guiding panel further comprises a first light conducting edge through which light

produced from said light producing means can be transmitted into said light guiding panel for total internal reflection between said first and second light guiding surfaces.

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37. (Original) The portable computer-based system of claim 35, which further comprises:

means for displaying on said display surface, a composite pixel pattern representative of a spatially multiplexed image composed of first and second spatially modulated perspective images of a 3-D object, said first spatially modulated perspective image consisting of a first pixel pattern representative of a first perspective image of said 3-D object spatially modulated according to a first spatial modulation pattern, said second spatially modulated perspective image consisting of a second pixel pattern representative of a second perspective image of said 3-D object spatially modulated according to a second spatial modulation pattern, said second spatial modulation pattern being a logical complement of said first spatial modulation pattern; and

a micropolarization panel comprising a optically transparent sheet mounted onto said display surface of said programmable spatial light mask, said optically transparent sheet having first and second optically transparent patterns permanently formed in said first optically transparent sheet, said first optically transparent pattern spatially corresponding to and being spatially aligned with said first pixel pattern so as to impart a first polarization state P_1 to said first pixel pattern, and said second optically transparent pattern spatially corresponding to and being spatially aligned with said second pixel pattern so as to impart a second polarization state P_2 to said second pixel pattern, said second polarization state P_2 being different than said first polarization state P_1 .

38. (Original) The portable computer-based system of claim 35, which further comprises
a display control means for controlling the spatial intensity of light emerging from
said programmable spatial light mask, and

wherein said programmable spatial light mask comprises a liquid crystal display
5 panel comprising an array of electrically addressable pixels, each said pixel having a light
transmittance that is controllable by said display control means.

39. (Previously Amended) The portable computer-based system of claim 35,
wherein said light guiding panel is made from an optically transparent plastic.

40. (Original) The portable computer-based system of claim 35, wherein said
light guiding panel comprises first and second light conducting edges, and wherein said
light producing means comprises first and second fluorescent tubes disposed along said
first and second light conducting edges, respectively, said first and second fluorescent
5 tubes producing and transmitting light through said first and second light conducting
edges during said direct viewing mode.

41. (Original) The portable computer-based system of claim 35, wherein said
backlighting construction further comprises
first and second light focusing elements disposed in proximity with said first and
second fluorescent tubes, respectively, for focusing light produced from said first and

- 5 second fluorescent tubes and directing said focused light across said first and second light conducting edges and into said light guiding panel.

42. (Twice Amended) An image display ~~device~~system having direct and projection viewing modes of operation, comprising an image display device including:

a transportable housing having first and second light transmission apertures formed therein and aligned with each other;

- 5 light producing means installed in said transportable housing, for producing light along a projection axis during said direct viewing mode;

a thin light focusing element mounted in said transportable housing along said projection axis;

- a rear housing panel having an interior surface and a spatial extent sufficient for
10 covering a substantial portion of said rear light transmission aperture during said direct viewing mode;

a light guiding panel attached to said rear housing portion, and having first and second light guiding surfaces between which said produced light can be totally internally reflected; a light reflective surface disposed between said light guiding panel and the

- 15 interior surface of said rear housing panel;

a light diffusing structure operably associated with said light guiding panel, for scattering light within said light guiding panel during said direct viewing mode; and

a programmable spatial light mask disposed adjacent said thin lens panel, and having a display surface and means for spatially modulating the intensity of light

20 transmitted through said programmable spatial light mask during said projection viewing mode;

a light projection device including

a first housing portion containing a light producing device for producing visible light, and a light focusing means for focusing and directing said produced

25 visible light on the display surface of said programmable spatial light mask;

a second housing portion having a light image projecting lens for projecting onto a viewing surface, the image displayed on the display surface of said programmable spatial light mask; and

a reconfigurable structure operably connecting said first and second
30 housing portions, said reconfigurable structure being positionable about said display panel housing when said light projecting device is used in conjunction with said image display device, and permitting said first and second housing portions to be brought together into a compact arrangement when said portable light projecting device is being stored or transported;

35 wherein during said direct viewing mode, light is produced from said light producing means and is reflected within said light guiding panel and scattered by said light diffusing structure, and a portion of said scattered light is transmitted through said first light guiding surface and said programmable spatial light mask, whereupon said transmitted light is spatial-intensity modulated so as to form a light image on the display
40 surface of said programmable spatial light mask; and

wherein during said projection viewing mode, light is produced from the light projection device and is transmitted through said thin light focusing element and said

programmable spatial light mask, whereupon said transmitted light is focused and spatial-
intensity modulated so as to form a light image on a viewing surface disposed at a
45 distance from said programmable spatial light mask.

43. (Original) The image display device of claim 42, which further comprises
means for hingedly connecting said light guiding panel or said rear housing panel
to said transportable housing.

44. (Original) The image display device of claim 42, wherein said light guiding
panel has first and second light conducting edges, and wherein said light producing
means comprises first and second fluorescent tubes disposed along said first and second
light conducting edges, respectively, said first and second fluorescent tubes producing
5 and transmitting light through said first and second light conducting edges during said
direct viewing mode.

45. (Original) The image display device of claim 44, which further comprises
first and second light focusing elements disposed in proximity with said first and second
fluorescent tubes, respectively, for focusing light produced from said first and second
fluorescent tubes and directing said focused light across said first and second light
5 conducting edges and into said light guiding panel.

47. (Previously Canceled)

Please Cancel Claim 48.

49. (Twice Amended) A portable computer-based system having direct and projection viewing modes of operation, comprising:

data storage means, disposed in said transportable housing, for storing data representative of one or more light images to be displayed;

5 an image display device including

a transportable housing of compact construction and having first and second light transmission apertures formed therein and aligned with each other,

~~data storage means, disposed in said transportable housing, for storing data representative of one or more light images to be displayed;~~

10 a backlighting construction disposed in said transportable housing, having direct and projection viewing modes of operation, and including

a rear housing panel having an interior surface and a spatial extent sufficient for covering a substantial portion of said rear light transmission aperture during said direct viewing mode,

15 light producing panel installed in said transportable housing, for producing light along a projection axis during said direct viewing mode, a thin lens panel mounted in said transportable housing, and

a programmable spatial light mask, disposed adjacent said thin lens panel, for spatially modulating the intensity of light transmitted through

20 said programmable spatial light mask:

a light projection device including

a first housing portion containing a light producing device for producing visible light, and a light focusing means for focusing and directing said produced visible light on the display surface of said programmable spatial light mask;

a second housing portion having a light image projecting lens for projecting onto a viewing surface, the image displayed on the display surface of said programmable spatial light mask; and

a reconfigurable structure operably connecting said first and second housing portions, said reconfigurable structure being positionable about said ~~display panel~~ transportable housing when said light projecting device is used in conjunction with said image display device, and permitting said first and second housing portions to be brought together into a compact arrangement when said portable light projecting device is being stored or transported;

wherein during said direct viewing mode, light is produced from said light producing panel and is transmitted through said thin lens panel and said programmable spatial light mask, whereupon said transmitted light is focused and spatial-intensity modulated so as to form a light image on the display surface of said programmable spatial light mask, and

wherein during said projection viewing mode, light is produced from the light projection device and is transmitted through said thin lens panel and said programmable spatial light mask, whereupon said transmitted light is focused and spatial-intensity

modulated so as to form a light image on a viewing surface disposed at a distance from
45 said programmable spatial light mask.

50. (Original) The portable computer-based system of claim 49, which further comprises

a display control means for controlling the spatial intensity of light emerging from
said programmable spatial light mask, and

5 wherein said programmable spatial light mask comprises a liquid crystal display panel comprising an array of electrically addressable pixels, each said pixel having a light transmittance that is controllable by said display control means.

51. (Original) The portable computer-based system of claim 49 wherein said light producing panel comprises an optically transparent plastic panel.

52. (Twice Amended) An image display ~~device~~system having direct and projection viewing modes of operation, comprising a image display device including:

a transportable housing having first and second light transmission apertures formed therein and aligned with each other,

5 a rear housing panel having an interior surface and a spatial extent sufficient for covering a substantial portion of said rear light transmission aperture during said direct viewing mode;

a light producing structure attached to the interior surface of said rear housing portion, for producing light in the direction of a projection axis during said direct viewing

10 mode;

a thin light focusing element mounted in said transportable housing along said projection axis;

a programmable spatial light mask, disposed adjacent said thin lens panel, and having a display surface and means for spatially modulating the intensity of light

15 transmitted through said programmable spatial light mask during said projection viewing mode;

a light projection device including

a first housing portion containing a light producing device for producing visible light, and a light focusing means for focusing and directing said produced visible light on the display surface of said programmable spatial light mask;

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a second housing portion having a light image projecting lens for projecting onto a viewing surface, the image displayed on the display surface of said programmable spatial light mask; and

a reconfigurable structure operably connecting said first and second housing portions, said reconfigurable structure being positionable about said ~~display panel~~transportable housing when said light projecting device is used in conjunction with said image display device, and permitting said first and second housing portions to be brought together into a compact arrangement when said portable light projecting device is being stored or transported;

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30 wherein during said direct viewing mode, light is produced from said light
producing structure and is transmitted through said thin light focusing element and said
programmable spatial light mask, whereupon said transmitted light is focused and spatial
intensity modulated so as to form a light image on the display surface of said
programmable spatial light mask; and

35 wherein during said projection viewing mode, light is produced from the light
projection device and is transmitted through said thin light focusing element and said
programmable spatial light mask, whereupon said transmitted is focused and spatial
intensity modulated so as to form a light image on a viewing surface disposed at a
distance from said programmable spatial light mask.

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53. (Original) The image display device of claim 52, which further comprises
means for hingedly connecting the assembly of said light producing structure and
said rear housing panel to said transportable housing.

54. (Original) The image display device of claim 52, wherein said thin light
focusing element is a thin light focusing panel and wherein said light reducing structure is
a thin light producing panel.

Please Cancel Claim 55.